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First Named Inventor	Kitamura, Manabu
Art Unit	2186
Examiner Name	Unassigned
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ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☒ Renewed Petition to Make Special
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
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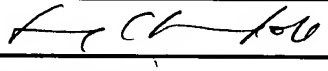
Signature			
Printed name	Chun-Pok Leung		
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Typed or printed name	Joy Salvador	Date	August 8, 2005

PATENT
Attorney Docket No.: 16869B-103600US
Client Ref. No.: HAL303
(340400292US01)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

MANABU KITAMURA

Application No.: 10/814,706

Filed: March 30, 2004

For: ASSURING GENUINENESS OF DATA STORED ON A STORAGE DEVICE PERFUSION

Customer No.: 20350

Examiner: Unassigned

Technology Center/Art Unit: 2186

Confirmation No.: 7212

RENEWED PETITION TO MAKE SPECIAL FOR NEW APPLICATION UNDER M.P.E.P. § 708.02, VIII & 37 C.F.R. § 1.102(d)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Decision dated July 11, 2005 dismissing the original petition to make special, Applicants respectfully submit a renewed petition to make special the above-identified application under MPEP § 708.02, VIII & 37 C.F.R. § 1.102(d). The application has not received any examination by an Examiner.

Pursuant to the Decision, Applicants have removed U.S. Patent Application No. 10/808,792 for the purpose of the petition, but the Examiner is urged to consider this reference and Applicants' remarks during examination.

(a) The Commissioner has previously been authorized to charge the petition fee of $130 under 37 C.F.R. § 1.17(i) and any other fees associated with this paper to Deposit Account 20-1430.

(b) All the claims are believed to be directed to a single invention. If the Office determines that all the claims presented are not obviously directed to a single invention, then Applicants will make an election without traverse as a prerequisite to the grant of special status.

(c) Pre-examination searches were made of U.S. issued patents, including a classification search and a foreign patent database search. The searches were performed on or around March 17, 2005, and were conducted by a professional search firm, Mattingly, Stanger Malur & Brundidge, P.C. The classification search covered Class 705 (subclasses 1, 35, 36, and 27), Class 707 (subclasses 9 and 200), Class 711 (subclasses 112, 114, 161, and 162), and Class 714 (subclasses 6 and 20). Because of the large size of these subclasses, keywords were used to narrow of number of documents returned. The foreign patent database search was conducted using Espacenet database and Japanese patent database.

(d) The following references, copies of which were previously submitted, are deemed most closely related to the subject matter encompassed by the claims:

(1) U.S. Patent No. 5,930,358;

(2) U.S. Patent No. 6,173,377 B1;

(3) U.S. Patent No. 6,732,124 B1;

(4) U.S. Patent No. 6,732,125 B1;

(5) U.S. Patent No. 6,829,688 B2;

(6) U.S. Patent Publication No. 2002/0032640 A1;

(7) U.S. Patent Publication No. 2004/0186858 A1;

(8) U.S. Patent Publication No. 2004/0260966 A1;

(9) U.S. Patent No. 6,341,317 B1; and

(10) U.S. Patent No. 5,546,536.

(e) Set forth below is a detailed discussion of references which points out with particularity how the claimed subject matter is distinguishable over the references.

A. Claimed Embodiments of the Present Invention

The claimed embodiments relate to the field of storage device and, more particularly, to techniques to assure the genuineness of data stored in storage devices.

Independent claim 1 recites a storage system coupled to a host computer via a first interface. The storage system comprises a second interface coupled to a console for receiving management operation to the storage system from the console; a storage controller including a central processing unit that conducts an I/O operation from the host computer and the management operation from the console; and storage volumes defined by at least one storage device. The storage controller collects log information of the management operation on at least one of the storage volumes.

One of the benefits that may be derived is that by collecting log information of the management operation on at least one of the storage volumes by the storage controller, genuineness of data stored in the storage device is assured.

B. Discussion of the References

1. U.S. Patent No. 5,930,358

U.S. Patent No. 5,930,358 to Rao, shows a storage device 106 having a disk or tape drive that includes a nonvolatile erasable memory 212 that stores parameters that control the operation of the storage device. The memory 212 is easily updated with new algorithms and allows for the changing of parameters and variables therein without physically substituting memory chips constituting the memory 212. The parameters for controlling the operation of the storage device are changeable through a graphical user interface of a host computer 100. The storage device has default settings stored in the erasable nonvolatile memory 212 which are programmed by the manufacturer of the storage device. The drive will operate in accordance with these default settings or parameters until the user changes the parameters. See, e.g., Abstract and column 1, line 48, through column 3, line 20; column 5, lines 52-59; and column 6, lines 46-62.

While Rao teaches a storage drive assembly having a nonvolatile memory storing control parameters, Rao does not teach a storage controller that collects log

information of a management operation on at least one of the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

2. U.S. Patent No. 6,173,377 B1

U.S. Patent No. 6,173,377 B1, to Yanai et al., shows a system that controls storing of primary data received from a primary host computer 12 on a primary data storage system 14, and additionally controls the copying of the primary data to a secondary data storage system controller 44, which forms part of a secondary data storage system 46, for providing a back-up copy of the primary data on the secondary data storage system which is located in a geographically remote location from the primary data storage system. Each storage system includes logical volumes, and the operating mode for each logical volume can be specified to best suit the purposes of the desired remote mirroring, the particular application using the volume, and the particular use of the data stored on the volume. Log files are kept for recovery purposes. For example, in one application-based recovery scheme, an application program maintains a log file of all writes to a data file. See, e.g., column 2, line 32, through column 5, line 16.

Yanai et al. discloses log files kept for recovery purposes, but does not teach a storage controller that collects log information of a management operation on at least one of the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

3. U.S. Patent No. 6,732,124 B1

U.S. Patent No. 6,732,124 B1, to Koseki et al., shows a data processing system with a logging mechanism that stores log records for repairing an inconsistent file system. This system includes a primary storage subsystem, a secondary storage subsystem, and a plurality of metadata volumes (e.g., 1a, 1b, 1c), created in the secondary storage

subsystem, which store a plurality of metadata objects describing files. A log volume (e.g., 2) is created in the secondary storage subsystem to store log records describing updates made to the metadata objects, and a metadata cache (e.g., 3) is created in the primary storage subsystem to temporarily store the metadata objects. A metadata loading unit (e.g., 4), in response to a transaction attempting to update metadata objects, loads the requested metadata objects from the metadata volumes to the metadata cache. A metadata manager (e.g., 5) holds metadata volume identifiers associated with the metadata objects loaded to the metadata cache, where the metadata volume identifiers indicate in which of the metadata volumes the metadata objects were stored. Additionally, a log collection unit (e.g., 7) collects log records indicating what updates were made to the metadata objects in the metadata cache, where each log record contains the metadata volume identifiers corresponding to the updated metadata objects. Also provided is a log buffer (e.g., 8) which stores the log records collected by the log collection unit, and a log writing unit (e.g., 9) which transfers the log records from the log buffer to the log volume. See, e.g., column 5, lines 6-42.

Koseki et al. discloses a metadata cache, but this is not the same as collecting log information of the management operations on storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

4. U.S. Patent No. 6,732,125 B1

U.S. Patent No. 6,732,125 B1, to Autrey et al., shows a self-archiving log structured volume 16 operable for transferring to backup storage all changes made to a volume of data controlled by a storage application 14. The self-archiving log structured volume is a log structured volume that guarantees that all blocks referenced from its index are present in a finite length of its log 22 and moves inactive segments 30 of the log to and from backup storage 20. When migrating to the backup storage, the volume may reduce the size of the log by ignoring earlier versions of a duplicated block within the segment. Because synch events are captured in the log, the self archiving log structured volume may move the segments without the knowledge of the storage application that owns the volume and still maintain the integrity of the storage application. The archiving process is asynchronous and

concurrent with the normal operation of any storage application using the self archiving log structured volume as a data store. See, e.g., FIG. 2; and column 2, line 62, through column 4, line 12.

Autrey et al. discloses a self-archiving log for transferring changes of data to backup storage, but does not teach the collection of log information of the management operation on the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

5. U.S. Patent No. 6,829,688 B2

U.S. Patent No. 6,829,688 B2, to Grubbs et al., shows a system and method for capturing a point- in-time image of a file system utilized within a data storage system employing logical volumes mapped across physical volumes. The point-in-time backup process begins with receipt of a file system backup request (304). In response to receiving the file system backup request, buffered file system data is written or flushed to the logical volumes (306). Thus, in response to the file system backup request, buffered user data is written to the logical volumes (310), buffered meta data associated with the buffered user data is written to a file system backup log within the logical volumes (308), and the buffered meta data is written to the logical volumes (312). A disk copy of the designated physical volumes is initiated in response to the writing of the buffered file system data to the logical volumes. See. e.g., FIG. 3; and column 2, line 65, through column 3, line 13.

Grubbs also discloses creation of a meta data log, which is not the same as the collection of log information of the management operation on the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

6. U.S. Patent Publication No. 2002/0032640 A1

U.S. Patent Publication No. 2002/0032640 A1, to LaFore et al., shows a data processing system for managing broker transaction information that includes the ability to monitor and record any and all data changes made to previously entered trade records. The audit function prevents the changing of any trade record data without some record being made thereof in the main database. This security feature ensures that all data is entered and recorded, whether it be the entry of original data for a trade transaction, or necessary changes which sometimes need to be made to trade data. A trade audit report may be generated which shows a change status with regard to each trade record. See, e.g., paragraphs [0012]-[0018] and [0101]-[0107].

LaFore et al. discloses an audit function that ensures all data is entered and recorded, but does not discuss a storage controller that collects log information of management operation on at least one of the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

7. U.S. Patent Publication No. 2004/0186858 A1

U.S. Patent Publication No. 2004/0186858 A1, to McGovern et al., shows a write-once-read-many (WORM) storage system 100 that employs large-capacity disks in connection with a file system on a file server 112 that contains most or all of the required WORM functionality. The system is organized around WORM storage volumes 116 that contain files that, when committed to WORM storage, cannot be deleted or modified. Any file path or directory tree structure used to identify the file within the WORM volume is locked and cannot be deleted. A file is written to a volume and committed to WORM state by transitioning the file attributes from a not-read-only state to a read-only state. The file system persistently stores the WORM state of a file with the attributes and metadata for the file and uses this persistent WORM state to recognize WORM files on a WORM volume. Henceforth, any attempt to modify the file attributes, write to the file, or delete the file, by clients, administrators or other entities is rejected and a request denied message is returned to

the attempting party. Committing of the WORM file to the WORM storage volume can be performed by the client via a command line interface in an interactive manner. Also, selected mirroring and backup functions may be allowed, while other backup functions that enable restoration or reversion of the volume to an earlier point in time may be disabled. See. e.g., paragraphs [0014]-[0017].

McGovern et al. discloses WORM storage that cannot be deleted or modified, but does not teach a storage controller that collects log information of management operation on at least one of the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

8. U.S. Patent Publication No. 2004/0260966 A1

U.S. Patent Publication No. 2004/0260966 A1, to Kaiya et al., shows an external storage and data recovery method. The system includes a management terminal 16 for maintaining and managing the storage system 60, and data may be automatically recovered to a desired arbitrary point in an external storage without imposing a burden on the host computer. An application on a host computer 100 instructs data recovery control processing of a disk control apparatus 200 to set a recovery opportunity. It is possible to register arbitrary plural points as a recoverable point by setting a recovery flag D34 included in journal data D20. The disk control apparatus recovers the data to the designated point on the basis of a backup disk 420 and a journal disk 430. The journal data includes at least writing data, a writing position, and recovery flag information serving as mark information. A data structure of the journal data is extended by adding a recovery flag. A data area for setting a recovery flag is included in all journal data in advance. See, e.g., Abstract; FIGS. 1-3; and paragraphs [0061]-[0072].

Kaiya et al. discloses the use of a journal disk and journal data, but does not teach a storage controller that collects log information of management operation on at least one of the storage volumes. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving

management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

9. U.S. Patent No. 6,341,317 B1

This reference relates to managing a log of information in a computer system including a host computer and a storage system that stores data accessed by the host computer. The computer system includes a plurality of logical volumes of data that are visible to the host and the storage system and that are perceived by the host computer as comprising a plurality of raw storage devices. The storage system includes at least one physical storage device and at least one mapping layer that maps the logical volumes to the physical storage device.

The log includes information concerning I/O operation, but not management operation. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

10. U.S. Patent No. 5,546,536

This reference discloses a log for managing data in a shadow set of storage media includes a system for maintaining a log of address information associated with at least one write command received from one of a plurality of data processing devices. The system for maintaining a log of address information includes a device for receiving a write command from a data processing device, a device which writes data associated with the write command in a section of one of the storage media, and a device which writes address information in a log indicative of the location of that section. A device is provided which then implements a management operation on data stored on one of the storage media in accordance with the address information stored in the log.

The log includes information concerning I/O operation, but not management operation. The reference fails to teach a storage system coupled to a host computer via a first interface, a second interface coupled to a console for receiving management operation to the

storage system from the console, and a storage controller that collects log information of the management operation on at least one of the storage volumes, as recited in independent claim 1.

(f) In view of this petition, the Examiner is respectfully requested to issue a first Office Action at an early date.

Respectfully submitted,

Chun-Pok Leung
Reg. No. 41,405

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 415-576-0300
RL:rl
60556174 v1